Student Name: Suman Kumar
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GitHub Link: https://github.com/achuara/os-projrct.git

Considering the arrival time and burst time requirement of the process the scheduler schedules the processes by interrupting the processor after every 6 units of time and does consider the completion of the process in this iteration. The scheduler than checks for the number of process waiting for the processor and allots the processor to the process but interrupting the processor every 10 unit of time and considers the completion of the processes in this iteration. The scheduler checks the number of processes waiting in the queue for the processor after the second iteration and gives the processor to the process which needs more time to complete than the other processes to go in the terminated state. The inputs for the number of requirements, arrival time and burst time should be provided by the user.

1. **Problem in terms of Operating System**

OS scheduler project This project was to develop a CPU scheduler using below scenarios compute the scheduler performance by providing the waiting time for process, turnaround time for process and average waiting time and turnaround time.

2. **Algorithm**

Input of arrival time ,burst time ,time quantum
!
^ then
scheduling
!
^ then
output Total turnaround time and waiting time calculated then
average waiting time and average turnaround time

3. **Complexity of Algorithm**

Complexicity=O(n)

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Note : No loop in side for loop

Sum of all loop compexicity lead to O(n)

```
#include<stdio.h>
#include<stdlib.h>
int main()// main start

{

int counting,n,a,timing,remain,flagvalue=0,time_quantume;// variable define

int wait_timing=0,turnaround_timing=0,array1[10],array2[10],array3[10];
printf("\n  = = = = = = = = = = = = = = = = = = = = = = = = =  = = = = = = = = = = = = = = = =
= = = = = = = = = = = = = = = =  ");
printf("\n \n\n  \t\t\t Enter number of total Process:\t ");          // const complexicity
scanf("%d",&a);
if(a==0){/////                    wrong enrty
printf("\n   sorry  !!!!   wrong entry");                          // const complexicity

  exit(1);
}
printf("\n \n  = = = = = = = = = = = = = = = = = = = = = = = = =  = = = = = = = = = = = = = = =
= = = = = = = = = = = = = = = = =  ");



remain=a;

for(counting=0;counting<a;counting++)   // inputs from user                        O(n)

{

printf("\n\n \t\t\tEnter arrival time for process , Process Number %d
:",counting+1);
scanf("%d",&array1[counting]);
if(array1[counting]==0){
printf("\n   sorry  !!!!   wrong entry");
```

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```
  exit(1);
}
printf("\n \t\t\tEnter  Burst Time for Process , Process Number %d :",counting+1);
scanf("%d",&array2[counting]);
if(array2[counting]==0){                              // const complexicity

printf("\n   sorry  !!!!   wrong entry");               // const complexicity

  exit(1);
}
array3[counting]=array2[counting];                    // const complexicity


}

printf("          \n\t\t\t enter time quantum:\t");          // const complexicity


scanf("%d",&time_quantume);

printf("\n\t\t\t process\t|turnaround time|waiting time\n\n");      // constcomplexicity


for(timing=0,counting=0;remain!=0;)                    //  O(n)

{

if(array3[counting]<=time_quantume&& array3[counting]>0)

{

timing+=array3[counting];

array3[counting]=0;

flagvalue=1;

}
```

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```
else if(array3[counting]>0)

{

array3[counting]-=time_quantume;

timing+=time_quantume;

}

if(array3[counting]==0 && flagvalue==1)                // O(n)

{

remain--;

printf("\t\t\t\tP[%d]\t|\t%d\t|\t%d\n",counting+1,timing-array1[counting],timing-array1[counting]-array2[counting]);

wait_timing+=timing-array1[counting]-array2[counting];

turnaround_timing+=timing-array1[counting];

flagvalue=0;

}

if(counting==a-1)       // const complexicity


counting=0;

else if(array1[counting+1]<=timing)

counting++;

else
```

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```
counting=0;

}
printf(" \n\n \t\t= = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =  ");

printf("\n\n \t\t\t average waitting timee= %f\n",wait_timing*1.0/a);
printf("\t\t\t avarage turnarroundе timee = %f",turnaround_timing*1.0/a);

printf(" \n \t\t= = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =  ");

printf("\n \n = = = = = = = = = = = = = = = = = = = = = =  = = = = = = = = = = = = = = = =
= = = = = = = = = = = = = = = =  ");
printf(" \n = = = = = = = = = = = = = = = = = = = = = = =  = = = = = = = = = = = = = = = = =
= = = = = = = = = = = = = = =  ");

return 0;
 //     over all  complexicity    O(n)

}
```

4. **Code**

```
#include<stdio.h>
#include<stdlib.h>
int main()// main start

{

int counting,n,a,timing,remain,flagvalue=0,time_quantume;// variable define

int wait_timing=0,turnaround_timing=0,array1[10],array2[10],array3[10];
printf("\n   = = = = = = = = = = = = = = = = = = = = = = = =  = = = = = = = = = = = = = = = =
= = = = = = = = = = = = = = = =  ");
printf("\n \n\n  \t\t\t Enter number of total Process:\t ");
scanf("%d",&a);
if(a==0){/////                        wrong enrty
```

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```
printf("\n   sorry  !!!!   wrong entry");
  exit(1);
}
printf("\n \n  = = = = = = = = = = = = = = = = = = = = = = =  = = = = = = = = = = = = = = =
= = = = = = = = = = = = = = = = =  ");



remain=a;

for(counting=0;counting<a;counting++)   // inputs from user

{

printf("\n\n \t\t\tEnter arrival time for process , Process Number %d
:",counting+1);
scanf("%d",&array1[counting]);
if(array1[counting]==0){
printf("\n   sorry  !!!!   wrong entry");
  exit(1);
}
printf("\n \t\t\tEnter  Burst Time for Process , Process Number %d :",counting+1);
scanf("%d",&array2[counting]);
if(array2[counting]==0){
printf("\n   sorry  !!!!   wrong entry");
  exit(1);
}
array3[counting]=array2[counting];

}

printf("         \n\t\t\t enter time quantum:\t");

scanf("%d",&time_quantume);

printf("\n\t\t\t process\t|turnaround time|waiting time\n\n");

for(timing=0,counting=0;remain!=0;)
```

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```
{

if(array3[counting]<=time_quantume&& array3[counting]>0)

{

timing+=array3[counting];

array3[counting]=0;

flagvalue=1;

}

else if(array3[counting]>0)

{

array3[counting]-=time_quantume;

timing+=time_quantume;

}

if(array3[counting]==0 && flagvalue==1)

{

remain--;

printf("\t\t\t\tP[%d]\t|\t%d\t|\t%d\n",counting+1,timing-array1[counting],timing-
array1[counting]-array2[counting]);

wait_timing+=timing-array1[counting]-array2[counting];

turnaround_timing+=timing-array1[counting];
```

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```
flagvalue=0;

}

if(counting==a-1)

counting=0;

else if(array1[counting+1]<=timing)

counting++;

else

counting=0;

}
printf(" \n\n \t\t= = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =  ");

printf("\n\n \t\t\t average waitting timee= %f\n",wait_timing*1.0/a);
printf("\t\t\t avarage turnarrounde timee = %f",turnaround_timing*1.0/a);

printf(" \n \t\t= = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =  ");

printf("\n \n = = = = = = = = = = = = = = = = = = = = = =  = = = = = = = = = = = = = = =
= = = = = = = = = = = = = = =  ");
printf(" \n = = = = = = = = = = = = = = = = = = = = = =  = = = = = = = = = = = = = = = =
= = = = = = = = = = = = = =  ");

return 0;

}
```

5. **Boundary Conditions**

   a) Number of processes should be positive.
   b) Arrival time and burst time should be greater than 0.

6. **Test Cases**

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I. **Test Case 1:** Enter number of processes greater than 0.
Output: Program will run.
II. **Test Case 2:** Enter number of processes less than 0.
Output: Program will terminate.
III. **Test Case 3:** Enter arrival time greater than 0.
Output: Program will run.
IV. **Test Case 4:** Enter arrival time less than 0.
Output: Program will terminate.
V. **Test Case 5:** Enter burst time greater than 0.
Output: Program will run.
VI. **Test Case 6:** Enter burst time less than 0.
Output: Program will terminate.
VII. **Test Case 7:** Enter the number of processes =3

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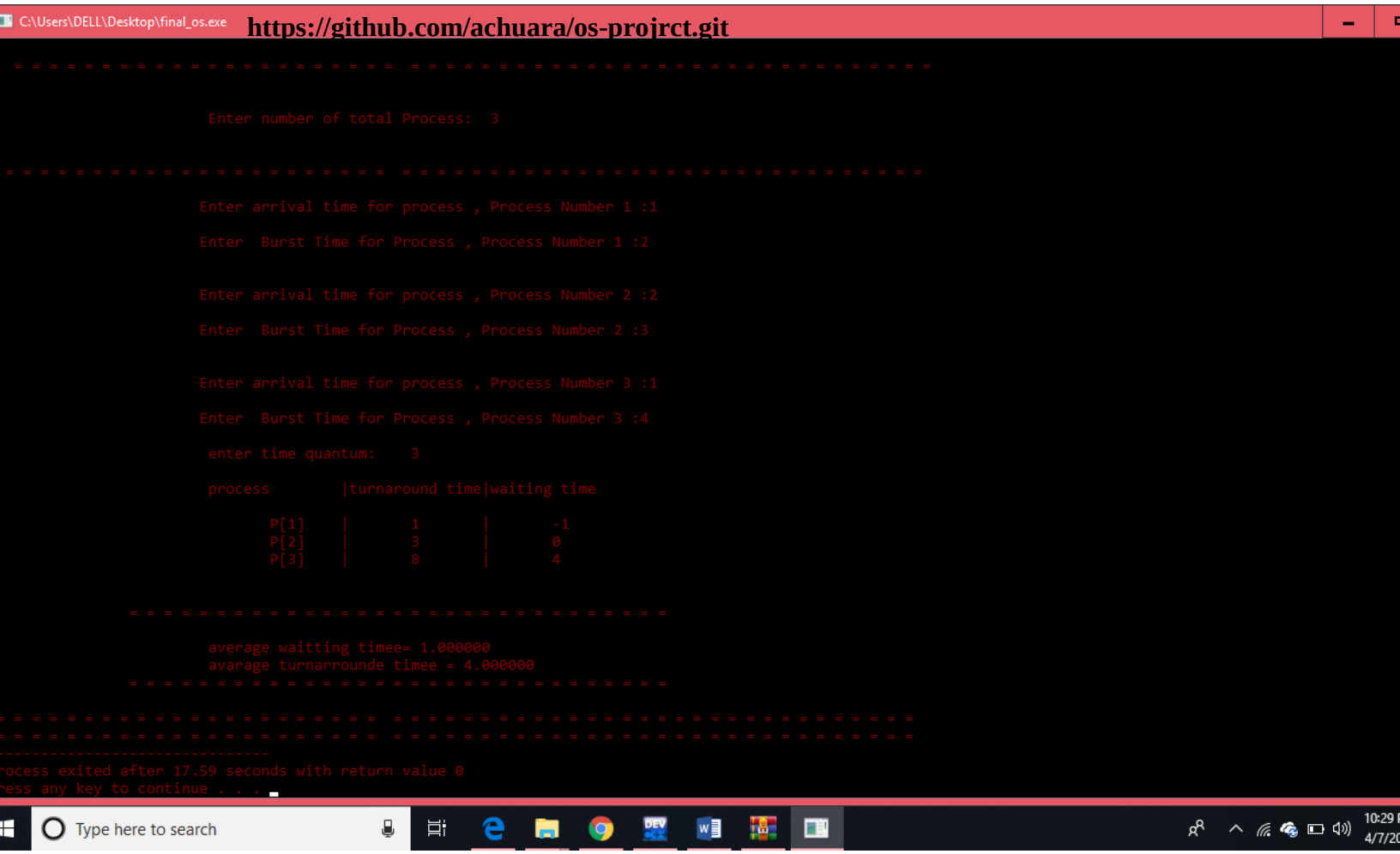
e.

7. **Test Case 7:** Enter the number of processes =3



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8. **GIT hub link::**

https://github.com/achuara/os-projrct.git